

SUPAI FLOOD 2008

FLOOD DAMAGE RECOVERY PLAN

AGENCY/UNIT: TRUXTON CANON AGENCY
BUREAU OF INDIAN AFFAIRS, WESTERN REGION

LOCATION: SUPAI, HAVASUPAI INDIAN RESERVATION AZ

DATE: August 31, 2008

PREPARED BY: Western Regional Supai 2008 Flood Recovery Evaluation Team



Submitted By:

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Date:

9/3/2008

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Recommended By:

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EXECUTIVE SUMMARY 2008 SUPAI INITIAL FLOOD DAMAGE ASSESSMENT AND RECOVERY PLAN

On the afternoons of August 15th-17 2008, the peak tourist season on the Coconino/Colorado River Plateau, thunderstorms dropped heavy rain over an area between the city of Williams and the Grand Canyon, producing significant flooding on Cataract Creek and the Havasupai Reservation (village of Supai). Total rainfall for the period from Friday the 15th through Sunday the 17th was generally light in the Supai area, but up to 4 to 6 inches within the Cataract Creek Drainage 20 to 40 miles southeast of Supai on the Coconino Plateau (as estimated by National Weather Service Doppler radar). As this water collected in the Cataract Creek drainage, it created significant flooding, breaching of Redlands Dam at the head of Cataract Creek, and the collapse of Fiftyfoot Falls on Havasu Creek. The creek channel over Navajo Falls shifted east, drying them up. The Havasupai Tribal campground below Havasu Falls was inundated with approximately 450,000 cubic yards of rock, soil and woody debris.

Approximately six hundred tourists and residents were stranded in the Havasu Creek Canyon. The Tribe and multiple public safety agencies worked together evacuating tourists and flooded-out residents Saturday through Monday (Aug 16-18th).

The Hualapai Trail into Supai Village had minor damage. Three village homes sustained water damage, the Tommy Siyuja and Burro bridges were damaged, and the irrigation system was silted in. 1600 feet of trail adjacent to Fiftyfoot Falls was destroyed or damaged. The bridge to Havasu Falls was destroyed, the Tribal Enterprise campground trail was wiped out, and more than six feet of soil and debris were deposited in the campground. Two tribal cemeteries became further threatened by erosion and potential collapse. Mooney Falls lower pool was filled with sediment and woody debris deposited on shorelines, Beaver Falls flowed muddy.

Bureau of Indian Affairs Regional Director Allen J. Anspach and Truxton Canon Agency Superintendent James Williams visited the Tribal Council on August 18 to determine tribal technical assistance needs. Based on the discussion, a Supai Flood 2008 Recovery Evaluation Team was mobilized. The team arrived in Valentine, Arizona the evening of August 20, 2008, had an in-briefing with the Agency Superintendent and drafted a Delegation (Delegation) of Authority. On August 21, the team met with the Havasupai Tribal Council, finalized and signed the Delegation and began the damage assessment process.

The primary technical objectives of the 2008 Supai Flood Evaluation Team are:

- Evaluate the trail from Hualapai Hilltop to Supai.
- Evaluate the trail from Supai to Mooney Falls, creating initial restoration recommendations and plan.
- Evaluate fencing lost to flooding, creating initial restoration recommendations and plan.
- Evaluate previous campground conditions and flooding damage, creating initial recommendations and restoration plan.
- Make an initial geologic and hydrologic evaluation and make suggestions for restoring Havasu Creek to world-class recreation standard.
- Evaluate irrigation system damages, creating initial restoration recommendations and restoration plan.

- Contact Babbitt Ranch regarding establishment of a flood early warning system at the head of Cataract Creek and learn the status of the web-mapped Remote Automated Weather System (RAWS) and its future operational status.
- Make an initial cemetery stabilization assessment.

Resource assessments produced by these specialists can be found in Appendix I and treatments identified in the assessments can be located within Part F, Specifications. A summary of treatment costs is located within Part E. A signature page for review and approval is located in the front of the plan. Appendix II contains the National Environmental Policy Act (NEPA) compliance summary for all recommended treatments. Appendix III contains ESR Plan maps while Appendix IV contains photo documentation of flood effects. Appendix V contains supporting documentation.

William Allen and Rich Goepfrich of the National Park Service made an evaluation of trail conditions from the entry point of the Hualapai Trail onto the Havasu Creek valley floodplain to Mooney Falls. Their report is included in the supporting documents.

Berdina Swimmer, BIA Truxton Canon Agency Social Services, Thomas Woodward, Red Cross Structural Damage Assessor and Angie Watahomigie, Havasupai Tribal Social Worker, made flood damage assessments of homes. The housing report is included in the supporting documents.

Havasupai Indian Reservation

The impacted area is located on the Havasupai Indian Reservation, Coconino County, Arizona. This area is the homeland of the Havasupai 'Baaja, "People of the Blue-green Water." The turquoise waters of Havasu Creek plunging over Navajo, Fiftyfoot, Havasu, Mooney and Beaver Falls attract approximately 30,000 visitors a year from across the planet who hike, ride horses or helicopter the 7.3 miles to the Supai community from Hualapai Hilltop. They may stay in the 24 room tribal hotel. They travel another 2 miles by foot or horse to swim in the pools below the falls and camp in Tribal Enterprise campgrounds between Havasu and Mooney Falls. Further use of this area includes hunting, livestock grazing, and the activities necessary to support the Havasupai way of life. The April 22, 2005 "Plan to Reduce Harm from Hazards to the Havasu Baaja" identifies living in Havasu Canyon and on the Coconino Plateau as the number one tribal priority. The number two tribal goal is to lessen risks and avoid losses associated with a variety of hazards. Flooding is the primary hazard identified. The August 17, 2008 flood incident is the 17th flood since 1898. The flow of water in Havasu Canyon produces a flood of tourists depending on helicopter, mule and horse transportation to the falls at a cost of \$85.00 or \$60.00 for each leg of the trip and a visitor's fee of \$35.00. A stay in the Havasupai Lodge is \$145.00. Camping is \$17.00 per night with an additional \$5.00 environmental care fee. This flow of tribal income ceased on August 15. In an August 20 news article in the Arizona Republic, Billy Jack with the tribal tourism office reported camping generates \$2,000,000 of annual income for the Tribe. As the Flood Recovery Evaluation Team prepared to leave the area on August 25, the Hualapai Lodge at Peach Springs was beginning to consider laying off employees due to reservation cancellations because people could not enter Havasu Canyon. The effect on the regional economy when Havasu Falls is inaccessible is unknown at this time.

Flood Background

The National Oceanographic and Aviation Administration, on its Flagstaff Arizona web page states,

“On the afternoons of August 15-17 2008 thunderstorms dropped heavy rain over the area between the city of Williams and the Grand Canyon, resulting in significant flooding on Cataract Creek and the Havasupai Reservation (village of Supai). Total rainfall for the period from Friday the 15th through Sunday the 17th was generally light in the Supai area, but as high as 4 to 6 inches within the Cataract Creek Drainage 20 to 40 miles southeast of Supai on the Coconino Plateau (as estimated by National Weather Service Doppler radar). As this water collected in the Cataract Creek drainage, it lead to significant flooding....”

During daylight hours on August 16, water entering Havasu Creek from a side canyon turned the water below the Havasu Falls pool red. Flood scent was in the air. Rangers began warning campers that flooding was likely and they should move to higher ground. At 10 PM Saturday August 16, the first major floodwaters entered Supai Valley raising Havasu Creek several feet. Notices were provided to BIA Law Enforcement and Coconino County. Tribal Search and Rescue went to work, helping stranded tribal members cross the swollen creek to high, dry ground. Tribal Rangers using all communication methods available to them continued to notify campers about the flood. The creek completing a jump from its channel over Navajo Falls sent its full volume toward Fiftyfoot and two unnamed gullies, poured down the channel, over Havasu Falls and into the campground. Campers climbed to high ground, many to a cemetery site or climbed trees to safety. Downstream, at Havasu Creek's confluence with the Colorado River, the rafts of 16 river tourists washed into the river, leaving them stranded. In the night, Fiftyfoot Falls eroded and approximately two acres of fifty foot tall earth, rock and covering vegetation went down canyon. The torrent cut away weak soils to the east, tearing out and further weakening a quarter mile of trail, scoured the creek bed to Havasu Falls, carried away the bridge and tore away a piece of the Havasu Fall's water gap. Mud, rock, vegetation and tree pieces filled the basin below the falls, tearing away the structure of the pool, pouring thousands of cubic yards of material into the widened stream channel where the campground lay. Slowing because the channel widened, backing when a dam of wood and debris collected where the canyon narrowed at Mooney Falls, the heaviest part of the sediment settled around and over picnic tables, porta-potties and composting toilets, the rest roaring over Mooney, filling the pool with flood debris, plastering ladders, chains and signs with red mud, painting 250 vertical feet of cliff wall with red mist a quarter mile downstream. The bed load tore things up some more going down the canyon, passed over Beaver Falls, poured into the Colorado. It was reported that the causeway at the head of Cataract Creek, on the Redlands Ranch, breached at 6 AM Sunday, August 17. Helicopters flew into action at the earliest opportunity, lifting tourists, campers and tribal members to safety. By Sunday afternoon, pictures taken by tribal member Merlin Manakaja from a helicopter were on the web showing Mooney Falls running mud, the basin of Havasu Falls full of mud and debris, Navajo Falls no longer running water and the re-channeled creek cutting an immense gully in the former Fiftyfoot Falls location. Airlift of the stranded tourists and residents continued until dark. Eighty seven campers remained in Supai on the evening of August 17 and the tribe housed them on the Supai basketball court, providing them with blankets, baloney sandwiches and water. They were airlifted to safety August 18, while law enforcement staff and tribal officials compared permit paperwork with airlift names. By August 20 it was determined that all were accounted for and unharmed. Havasu Creek flowed clear and fast to Mooney Falls.

Resource Damages and Threats to Human Safety and Resources

After the flooding of 2005, the Federal Emergency Management Agency (FEMA) funded the *“Plan to Reduce Harm from Hazards to the Havasu Baaja”* (Hazard Plan) supplementing the existing draft Havasupai Emergency Operations Plan. As mentioned previously, the Tribe's second highest priority is “Lessen risks and avoid losses” with flooding as the number one prevention priority. Components for reducing flood hazards included “Improve Prediction and Warning, Improve Response Capabilities, Teach Children (and Rangers) Life Saving. Alternative Actions include, “Install Disaster Resistant Bridges and Protect most Vulnerable Homes on West Side.” EPA then funded the Tribe to restore damages from the flood.

A collection of images taken by Byron Manakaja can be found on the DVDs supporting this document. They document the Tribe's completion of bridge and gabion installation and other tasks for FEMA reports. The sewer line to the west side was protected with gabions, irrigation turnouts and several homes along the creek channel were gabion-armored. Some damaged trails were gabion armored. Bridges were constructed to give way before floodwaters. Tribal members got swift water rescue and extrication training.

The approximately \$800,000, 2005 FEMA flood recovery investment applied using Hazard Plan goals produced a large payoff in 2008. There was slight damage to village infrastructure. Power, phone and water services were not lost. Three homes were slightly flooded. South of the village two bridges had their approaches wash away and slight structural damage. The irrigation system silted up but was not damaged. Some underground electrical conduit was exposed. The Havasupai Search and Rescue team members using techniques learned in training prevented loss of life and injury in the village.

No lives were lost or people injured and humankind got away lucky in the August 16, 2008 Havasu Creek flood.

The erosion of Fiftyfoot Falls produced a head cut traveling up to 400 feet closer to Supai Village. This is an alarming geologic event because the number one tribal goal is living in Havasu Canyon forever.

Havasupai Creek changed its course, drying up Navajo Falls for the time being while cutting a new channel and falls to the east.

Most tribal income ceased with the flood. Destruction of Fiftyfoot Falls trail and the campground assured a longer than usual lapse of income.

Because there have been 17 floods in Havasu Creek since 1898, and much work done between 1988 and the present, pre-existing NEPA and Threatened and Endangered Species Act documentation exists for similar work. See Appendix II for previous assessments. The team brought no NEPA Specialist due to their being busy with other emergency operations. All activities proposed within this plan comply with applicable laws and executive orders. If further Federal actions result from further investigations, appropriate NEPA documentation will be created in a timely manner.

Cultural

Soon after the team began meeting with the Havasupai Tribal Council concern was expressed for the Burro, Paya, and other cemeteries perched above the creek. Ongoing floods are eroding the rock and soil terraces where the cemeteries lie. We told the tribe we would evaluate preservation techniques. The Park Service Trails Evaluation completed by Bill Allen, Lead Trail Supervisor, Grand Canyon National Park recommends abandoning the east side trail and improving the west side trail. The public was previously allowed access to this trail but wandered inappropriately and removed cultural artifacts. This presents a dilemma for the tribe because the same thing will likely happen if the main travel route is shifted west.

Implementation

Based on ground survey the Team identified the following treatments for implementation with an initial cost estimate of \$2,523,981.

- Informational and Warning Sign Replacement
- Replace Missing Gabions at Mile Marker 6.2
- Earthen Dam at Mile 6.3
- Repair Pedestrian Bridge at Mile 6.4
- Repair by Rough Grading Hiking Trails and Removal of Debris
- Trail Closure
- Temporary Bridge Replacement Havasu Falls
- New Bridge Havasu Falls
- Diversion Gate Cleaning and Repair
- Irrigation Corrugated Metal Pipe (CMP) Cleanout
- Irrigation Ditch Cleaning
- Fence Repair Supai Community and Havasu Creek
- Camp Ground Picnic Table and Squirrel Poles
- Woody Debris Removal Havasu Creek
- Public Safety Early Warning System
- Geotechnical Analysis Havasu Creek
- Campground Repair Toilet Compost Cleanout
- Potable Water System Replacement
- Trash Removal

The Team and Agency Superintendent conducted a closeout presentation to the Havasupai Indian Tribe on September 3, 2008 providing findings and identifying proposed treatments.

At the conclusion of the funding period, a final Accomplishment Report is due. The Accomplishment Report will document the funding received (initial and supplemental funding), treatments installed, and the effectiveness of the installed treatments.